more the growth of the Tree; ſince every thing grows in proportion to the Root beneath: But I am doubtful in this, whether I do well or ill, and deſire the judgement of others. For, I have heard from ſome Planters, and afterwards from a Knight who had experience therein, that Roots cut ſhort doe beſt, as ſending forth New roots, which draw ſap and nouriſhment beſt. And we ſee that *Moyles* ſet on ſlips that have no roots, come to a Tree ſooner. And I have oft obſerved, that a *Moyle* Tranſplanted after it hath taken root does not live ſo certainly, or thrive ſo well as a ſlip newly ſet. But I have gone beyond the bounds of a Letter.

This Letter being imparted to an Ingenious Inquirer into ſuch things, he was pleaſed to return ſome of his conſiderations thereupon, which are like to be publiſhed in our next.

Some Obſervations, touching Colours, *in order to the Increaſe of* Dyes, *and the* Fixation *of Colours; generouſly imparted by the Author of the Four above-mention'd Letters, who annexed them to that of* Februar. 15. 1670.

TWo things, I conceive, are chiefly aimed at in the Inquiry of *Colours*, which ſubject you deſire my thoughts of; the *one*, to increaſe the *Materia Tinctoria*, and the *other*, to *fix*, if poſſible, thoſe colors, we either have already, or ſhall hereafter diſcover for uſe. As to the *firſt*, Animals and Vegetables, beſides other Natural Bodies, may abundantly furniſh us. And in both theſe kinds *ſome* Colours are *Apparent*, as the various colours of Flowers, and the juices of fruits, &c. and the *ſanies* of Animals: *others* are Latent, and diſcovered to us by the effects, the ſeveral Family's of Salt and other things may have upon them. Concerning the *Apparent* colors of Vegetables and Animals, and the various effects of different Salts in changing them from one colour to another; we have many Inſtances in M. *Boyle*. And if we might, with the good leave of that Honourable and Learned perſon, range them after our faſhion, we ſhould give you at leaſt a new Proſpect of them, and obſerve to you the conformity and agreement of the effects of Salt on the divers parts of Vegetables: *Viz.* 1. That *Acid* Salts *advance* the colours of Flowers and Berries, that is, according to the Experiments of M. *Boyle*, they make the infuſions of *Balauſtium* or Pomgranat-Flowers, Red roſes, Clove-jilly flowers, Meſerion, Peaſe-bloom, Violets,

Cyanus

Cyanus flowers, of a fairer red; alſo the juices of the Berries of *Liguſtrum*, of black Cherry's, Buck-thorn-berries, of a much fairer red: and to the ſame purpoſe Acid Salts make no great alterations upon the white flowers of Jaſmin and Snow-drops. 2. That *Vrinous* Salts,and *Alcaly's*, on the contrary, quite alter and change the Colours of the ſame flowers now named, and the juices of the ſaid Berries alſo,from red to green; even Jaſmin and Snow-drops. 3. Again,that in like manner *Vrinous* Spirits and *Alcaly's* advance,at leaſt do not quite ſpoyle the colors of the juices of leaves of Vegetables,of their Wood and Root. Thus M. *Boyle* tells us,that *Vrinous* Spirits and *Alcaly's* make the yellow infuſions of *Madder-roots* red; of *Brazil-wood*,purpliſh; of *Lignum Nephriticum*, blew; the red infuſion of *Log-wood*,purple; of the Leaves of *Sena*,red. 4. That, on the contrary,*Acid* Salts quite alter and change the ſaid infuſions from red or blew,to yellow.

In the next place we would note to you the effects of Salts upon *Animals* in the production and Change of colours;but the Inſtances are very few or none, that I meet with in any Author; the *Purple-fiſh* being quite out of uſe, and *Cochineil* and *Kermes* are by moſt queſtioned,whether they are Animals or no; but I think,we may confidently believe them both to be *Inſects*,that is, Worms or *Chryſalys*'s of reſpective Fly's *in proxima fœtura*. We find then,and have tried concerning *Cochineil* (which of it ſelf is red,) that upon the affuſion of the Oyl of Vitriol,that is, an *Acid* Salt,it ſtriks the moſt vivid *crimſon* that can be imagined; and with *Vrinous* Salts and *Alcaly's*, it will be again changed into an obſcure color 'twixt a violet and a purple. *Pliny* ſomewhere tells us, that the *Gaules* in his time could dye with Vegetables,what the Romans with ſo much danger and pains ſought for in the bottom of the Sea. Indeed, we find many Plants mentioned by the ſame Author, which either are not known to us at this preſent,or neglected.

To what we have briefly obſerved out of Authors, we will ſubjoyne ſome of our own Conſiderations and Tryals And *firſt*, concerning the *Apparent* Colours in Flowers, we think we may inſert; 1. That generally all Red,Blew and White flowers are immediately, upon the affuſion of an *Alcaly*, changed into a Green colour,and then,in proceſs of no long time,turned Yellow. 2. That all the parts of Vegetables, which are green,

will

will in like manner ſtrike a Yellow with an *Alcaly*. 3.That what Flowers are already yellow, are not much changed,if at all,by an *Alcaly* or *Vrinous* Spirit. 4.The Blew ſeed-husks of *Glaſtum Sylveſtre* old,gathered and dry,diluted with water,ſtain a Blew, which upon the affuſion of Lye ſtriks a Green, which Green or Blew being touched with the Oyl of Vitriol dyes a Purple; all theſe three colours ſtand. 5.On the tops of *Fungus tubuloſus*,ſo called by M.*Wray* in his late Catalogue of the Plants of *England*,are certain red knots; theſe,upon the affuſion of Lye, will ſtrike a Purple,and ſtand.

As for the *Latent* Colours in Vegetables and Animals; to be diſcovered to us by the affuſion of Salts; they likewiſe, no doubt, are very many. We will ſet down only a few inſtances in both kinds, which have not been,that we know of, diſcovered or taken notice of by others. *Latent Vegetable* colours, 1.The Milky juice of *Lactuca Sylveſtris coſtâ ſpinoſa*, and *Sonchus aſper & lævis*, upon the affuſion of Lye, will ſtrike a vivid flame-colour or Crimſon,and after ſome time quite degenerate into a dirty yellow. 2.The Milk of *Cataputia minor*, upon the affuſion of Lye, eſpecially if it be drawn with a knife, and hath any time ſtood upon the blade of it,will ſtrike a Purple or Bloud-red colour,and by and by change into an ignoble yellow. *Latent Animal* dyes, 1.The common Hawthorn-Caterpillar will ſtrike a Purple or Carnation with Lye, and ſtand. 2.The heads of Beetles and Piſmires, &c. will with Lye ſtrike the ſame Carnation-colour,and ſtand. 3. The Amber-coloured *Scolopendra* will give with lye a moſt beautiful and pleaſant *Azure* or *Amethyſtine*, and ſtand.

Laſtly,we might conſider the *Fixing* of colours for Uſe; but we are willing to leave this to more experienced perſons;as alſo the Philoſophizing on the particulars we have produced,to better Heads. Some obvious Inferences we may venture to take notice of; 1. That in all the Inſtances above mentioned,whether Vegetable or Animal, there is not one colour *truly* fixed,however there may,I conceive,be ſome uſe made of them,as they are. I ſay,*truly fixed*, that is, proof of Salt and Fire; for,what ſeem to *ſtand* and be *Lye-proof*, are either wholly deſtroyed by a different Salt, or changed into a much different colour; which muſt needs prove a ſtain and blemiſh when it ſhall happen in the uſe of any of them. 2. That both the

apparent

apparent and latent colours of Vegetables are *fixable:* An inſtance whereof we may obſerve in the ſeed-husks of *Glaſtum*, and the Uſe Diers make of the leaves after due preparation. 3. It is probable from the ſame inſtance, that we may learn from the colour of ſome part of the Fruit or Seed, what colour the Leaves of any Vegetable and the whole Plant might be made to yield for our uſe. 4. That the *Latent* colours of Vegetables are præexiſtent, and not produced; from the ſame inſtance of *Woad*, and likewiſe from this that the *Milky* juyce of *Lactuca Silveſtris* doth afford it ſelf a *Red* Serum. 5. That the change of colours in Flowers is gradual and conſtant. 6. That the colours of Flowers, which will not ſtand with Lye, ſeem to be wholly deſtroyed by it, and irrecoverable: Thus it happens in the Experiment; that one part of a Violet-leaf, upon the affuſion of Lye, is changed very ſoon into yellow, and will never be revived into a red by an Acid ſalt; but if another part of the ſame leaf be ſtill green, it will be revived, 7. That the Dryneſs ſeems to be a means, if not of *fixing*, yet bringing the Vegetable colour into a condition of not wholly and ſuddainly periſhing by the otherwiſe deſtroying *Alcaly*. 8. That thoſe Plants or Animals that will ſtrike different and yet vivid colours upon the affuſion of different Salts, and ſtand, as the *Cochinel* and *Glaſtum*, are probably of all others to be reckoned as the beſt Materials.

It would have been a much ſafer way, to have put theſe Inferences in the faſhion of *Quæri's*; but beſides that I affirm no more but matter of fact, it is lawful for our encouragement (as my Lord *Bacon* adviſes) to ſet up reſts by the way, and refreſh our ſelves with looking back, though perhaps we have not much advanced. You will be pleaſed to excuſe the little cohærence that I have uſed in theſe notes, and attribute it to the readineſs and affection I have to anſwer ſuch inquiries as you put to me. I never yet did make this ſubject any part of my buſineſs, but the deſire I have to ſearch after and examine the Medicinal qualities of things in Nature, hath by the by preſented me with ſuch *Phænomena*, as I was not willing to leave unnoted, nor to refuſe them you, though in a confuſed way, becauſe you deſire them. To conclude, how immethodical and barren theſe papers may ſeem; yet the conſideration of them hath led me to a way of *Fixing* colours, which I willingly forbear to relate, until I may have an opportunity of ſhewing the Experiment before the *R. Society.* I have found out a Colour moſt exquiſitely black,& comparable to the beſt ink;even in the uſe of the pen, and which will not change by Fire or Salt. This an *Engliſh* Vegetable yielded me, and for ought I know (for I have not repeated the trial on any thing elſe) the like method will ſucceed to good purpoſe. I am, *&c.*

An Accompt of ſome Books.

I. *Theodori Kerckringii M. D, ANTHROPOGENIÆ ICHNOGRAPHIA, ſive Conformatio Fœtus ab Ovo uſque ad Oſſificationis principia, in ſupplementum Oſteogeniæ Fœtuum.* Amſtelodami, 1671. *in* 4°.

After that this Author had the laſt year publiſhed, together with a *Specilegium Anatomicum*, his *Oſteogenia Fœtuum* (both which were deſcribed *N°*.54.*p.* 1094. *ſeqq.*of theſe Tracts;) in in the latter of which he had given an Accompt of the Formation of the *Bones* of an Humane Body, from the *Second* Month after Conception to the very time of the Infants Birth; he conſidered, that there were two things yet left behind,neceſſary to the perfect knowledge of *Oſſification*;*viz. Firſt*,what might be the Rudiments and Form of an Human Body, before it came to have any Firmneſs of Bones. *Secondly*, How after an Infants being born, the ſoft Bones acquire by little and little both their Hardneſs and Magnitude. Waving for the preſent the latter of theſe two, he undertaketh in theſe ſheets (which are but *three*) to deliver the firſt Elements, as 'twere of our Body, *from* and even *before* the time of Conception; affirming.

1. *Non tantùm in nuptis & fœcundis Mulieribus, ſed etiam in Virginibus eſſe non minùs quàm in Gallinis ova ponentibus etiam citra Galli conſuetudinem, ova quædam* * *piſi viridis magnitudine, in quibus humor latet intus, qui, uti aliorum ovorum albumen & vitellus, dum coquitur, indureſcit : Porro, ova illa mulierum, pelliculis extrinſecus circumdari, quæ poſtquam in uterum prolapſa ſunt ova coitu fœcundata, in Amnion & Chorion brevi commutentur; ova autem ipſa, duorum vel trium dierum ſpatio ad ceraſi nigri majoris magnitudinem excreſcere.*

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* *Vide* Nic. Stenonis Muſculi Deſcriptionem Anatomicam *editam* A. 1667. *& deſcriptam N°*.32. *Ubi in Narrationum ibi annexarum poſteriori dictus Dn.* Steno *memorat, per digreſſionem,* dari in Fœminis Teſtes ovario analogos. *Ipſe Author noſter obſervat etiam,* Fallopium *jam tale quid notaſſe.*